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Academe Charged with Mishandling R&D Money

Officials from the General Accounting Office, the Office of Management and Budget, and HEW's Inspector General's Office gathered at a series of Congressional hearings last month to deliver perhaps the fiercest attack yet on the financial-management policies of the nation's universities.

Two academic researchers, subpoenaed to testify at the hearing, also renewed their assault on their own institutions, accusing them of illegally pooling their grants and deliberately mismanaging their funds. In response, university officials who administer government funds for their institutions came back with a strong defense of their own actions and argued that academe's alleged fiscal misdeeds are products of the government's clumsy and restrictive policies.

Where this fighting will lead is difficult to know. The House Committee on Government Operations, which held three days of hearings on the subject, has no specific

US Concedes Poor Preparation For Science Conference — Page 6

legislative remedies under consideration. Subcommittee Chairman L. H. Fountain (D-N.C.) said he mainly wanted to inspire discussion both on the way universities account for grant and contract funds awarded by federal agencies and on the way the agencies audit the use of those funds.

The centerpiece of Fountain's hearings was a GAO report, released in July to Congress, that showed HEW and other federal agencies have consistently failed to keep track of the funds they award to educational institutions. Based on a sampling of 20 institutions, the GAO study concluded that the procedures for auditing federal grant recipients are "uncoordinated, ineffective, and inefficient." The GAO also said it had found that about 30 per cent of the grant funds awarded to the sample institutions had not been audited at all by federal agencies, while others had been audited repeatedly.

Not surprisingly, HEW officials were quick to blame the universities for the problems.

"Throughout the years," said Harold Stugar, the GAO's Deputy Director of the Financial and General Management Studies Division, "our audits have consistently disclosed major problems in five areas which suggest that adequate recordkeeping and cost controls with respect to Federal funds are a widespread problem at colleges and universities. Too often we have concluded that we do not

have a sufficient degree of assurance that Federal funds have been used for the purposes that they were provided for."

According to Stugar, the major problem areas are: Inadequate salary and wage documentation, improper or inadequately documented cost transfers, undocumented consultant costs, weak cash-management systems, and poor procedures for acquisition, control, and accountability for equipment and supplies.

According to another witness, Robert J. Klebe, a research biologist, the problems are not accidental. Klebe, a member of the biology department at Johns Hopkins University in 1972 and 1973, charged the university with paying salaries from grant funds for work unrelated to the grant project.

Pointing to a government audit made after his allegations, Klebe, who is now an associate professor at the University of Texas Medical Branch in Galveston, said that "grant pooling did exist in the Department of Biology at Johns Hopkins University." Moreover, he said, an official departmental memo "indicates that the irregularities found by the NIH audit were not mere bookkeeping problems but were, in fact, elements of departmental policy and

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In Brief

The ouster of HEW Secretary Califano isn't expected to have any effects on the multi-billion R&D activities of that sprawling department. HEW's research programs move through long and sluggish pipelines, and not even a workaholic like Califano was able to produce any swift changes.

The biggest one that he sought — the development of "health research principles" to guide HEW's biomedical research spending — remains an ongoing exercise, with incoming Secretary Patricia Harris due to receive a recommended set of principles for use in writing the Fiscal 1981 budget. Whether she'll have any interest in such stuff is by no means certain.

White House Science Adviser Frank Press was not among the senior administration officials who were asked to submit pro forma resignations last month. Press' explanation for being denied this badge of honor is that the resignations were demanded from appointees involved with "politics and political matters," and he's not in that line of work, he told SGR.

... OMB Says New Regulations Will be Easier

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departmental philosophy."

A letter to the subcommittee from Hopkins President Steven Muller quoted HEW's auditors as saying that "of the many allegations made, we found support for only two . . . (T)hese irregularities do not exist to any significant degree, however, and we believe that in the main the costs charged to NIH grants have been suitable and reasonable."

"Without wishing to be derogatory to Dr. Klebe in any way," Muller wrote the subcommittee, "please let me also advise you that there is reason to believe that he is aggrieved at Johns Hopkins because his resignation from the faculty was requested unanimously by the senior faculty of his Department at the end of his first year here."

Meanwhile, Phin Cohen, a former Harvard University researcher, told the subcommittee he is going ahead with a suit against Harvard for grant mismanagement on behalf of himself "and the public trust." Appearing under subpoena with his lawyer, Cohen cited specific charges against Harvard, including that research funds have been used to pay teachers and individual workers who did not participate even indirectly in the research effort.

In April 1977, Cohen brought suit against Harvard President Derek Bok, the Dean of the School of Public Health, and the Chairman of the Department of Nutrition. The suit, which is in a pre-trial "discovery" stage in federal district court, seeks an audit of the institution and personal compensation for Cohen.

President Bok also submitted a letter to the House subcommittee, saying that there are "substantial disagreements between" his staff and HEW's audit team. But, he said, it would be "most inappropriate" to discuss aspects of Cohen's suit "in a public forum."

In another phase of the hearings, officials from HEW and OMB described a number of existing and forthcoming changes in the administration of government-university financial dealings. Embodied in OMB's Financial Priorities Program, these alleged improvements include the "standardization and simplification" of a number of federal grant regulations.

Among them is Circular A-110, "Uniform Requirements

for Grants to Universities, Hospitals, and Nonprofit Institutions." Published in the July 30, 1976, Federal Register, the regulations affect cash depositories, bonding and insurance, record retention, financial reporting, and so on.

"Our objective in each of these areas was to simplify and streamline federal requirements," W. Bowman Cutter, OMB's Executive Associate Director, told the House panel.

"Before the circular was developed, each agency and each program issued requirements of its own, and the cumulative burden of these requirements was crushing. The circular established a degree of uniformity and consistency in the way Federal agencies administer grants. It was applauded by the Federal Paperwork Commission, and by other groups concerned with cutting Government red tape and paperwork."

Proposed changes in a second regulation, Circular A-88, "Indirect Cost Rates, Audit, and Audit Followup at Educational Institutions," were published in the July 18, 1979 Federal Register.

The revision would continue the current policy of requiring HEW "to act for all agencies" in auditing educational institutions and in negotiating their indirect cost rates," said Cutter. Under the changes, however, HEW also would be required to follow up to assure the correction of problems turned up by the auditors. More than most changes, said another OMB official, John Lorden, "this change will insure that someone is keeping track" of the universities.

A third set of regulations, Circular A-73, "Audit of Federal Operations and Programs," was published in the May 15, 1978, Federal Register and revised in the July 10, 1979, edition.

As earlier requested by the House Committee on Government Operations, Cutter said, the revision would strengthen the audit followup of the original circular and establish procedures for resolving major disagreements between audit and program officials.

Equally important, said Cutter, circular A-73 would require HEW to act within six months on its audit recom-

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... New Management Rules Take Effect Oct. 1

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mentations. It would also require semi-annual reports to the agency head on unresolved audit findings. Finally, it would require periodic evaluations of the agency followup system.

On July 11, 1979, OMB proposed yet another revision to its Circular A-102, which is designed to implement the "single audit" concept, Cutter said. The revision would establish a standard audit guide to be used by federal agencies in place of some 100 guides that have been used by various agencies.

Many of the universities' fiscal problems, however, will be cleared up simply by enforcing the controversial Circular A-21, contended Edward W. Stepnick, HEW Assistant Inspector General for Auditing.

The rules, published in the March 6 Federal Register and scheduled to go into effect Oct. 1, 1979, affect the ways universities figure the "direct" costs of paying for salaries and materials under federal grants and contracts. They also determine what "indirect" expenses can be charged to the government, including utilities, janitorial services, and general administrative costs.

Stepnick argued that much of the criticism leveled by GAO against HEW is based on problems that existed before the revision in the A-21 regulations and, therefore, are not relevant to what the universities and the government will be doing in the near future.

"The attention being given to the new requirements is indicated by the fact that four symposiums given by COGR (the Committee on Governmental Relations of the National Association of College and University Business Officers) in various cities were attended by 535 individuals from 268 institutions," said Max A. Binkley, Vice President for Finance at Colorado State University. Despite their efforts, he said, universities face a lot of serious problems with the regulations.

"There is reason to believe that most institutions will do a competent job of implementation. They want to avoid reliving the experiences of the past."

"However, the new A-21 contains some inconsistencies and in certain places lacks clarity. Those parts may lead to the creation of new disputes or the continuation of old disputes.

"Moreover the new document imposes a still greater degree of compartmentalization of costs. In the process it adds significantly greater administrative costs on institutions, which will tend to increase the burden on the scarce institutional resources available for administration and on the share of administrative costs borne by the Government as indirect costs."

Binkley and his associates at the American Association of Universities offered several remedies. The most important, they said, is already in the legislative hopper,

S.988, the Health Service Promotion Act of 1979. Introduced by Senators Edward Kennedy, Richard Schweiker, and Harrison Williams, the bill would require the Director of NIH to experiment with various accounting procedures to develop techniques that meet the universities' need for flexibility and the government's demands for accountability.

"It may be that existing OMB accounting rules are the best that we can get, said AAU President Thomas A. Bartlett, "But we believe we should investigate other possibilities that would permit us to account properly to the American people under rules that are more consistent with university organization and the research process. The experimental approach advocated in the Senate bill is certainly a reasonable way of finding out," Bartlett said.

(The National Science Foundation has already started conducting such experiments on a small scale, but it is too soon to assess how they are working out.)

One of the most difficult problems, according to university administrators, is the "monitored workload system," a method of pre-determining payroll distribution in figuring research costs. The system is intended to enable institutions to calculate the effort devoted to federally sponsored projects on the basis of the usual assigned workloads, monitored to assure that no "significant" changes take place.

Although OMB included a version of the monitored workload system in its revision of Circular A-21, it excluded non-professional personnel in the calculations and deleted "significant" in describing changes in the workload that would have to be documented.

As a result, said Colorado's Binkley, rather than most of the institutions adopting the system as they originally said they would, the "overwhelming choice" is for the existing system of reporting each employee's activities, a system "with which neither the government nor the universities

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DOT Lists Research Interests

The Department of Transportation's Office of University Research has announced that those seeking for its money in Fiscal 1980 should confine their proposals to seven "general problem areas": Automatic controls in transportation systems, maintenance and rehabilitation of systems and facilities, technology for advanced transportation systems, transportation and community development, safety technology, transportation planning techniques, and freight transportation.

The list came with the announcement of 35 contract awards, totaling nearly \$2.8 million, to 28 universities.

White House Publications in New Bibliography

One of the better-kept secrets in Washington is that the Executive Office of the President has started publication of a quarterly bibliography of the numerous — and sometimes highly influential — reports, papers, and other publications that pour out of the units that make up the Executive Office of the President.

The first number, released just a few weeks ago, lists publications of the following groups:

Council of Economic Advisers
Council on Environmental Quality
Council on Wage and Price Stability
Domestic Policy Staff
Office of Drug Abuse Policy
Office of Energy Policy and Planning
Office of Management and Budget
Office of Science and Technology Policy
Office of the Special Representative for Trade Negotiations
Office of Telecommunications Policy (since transferred to the Commerce Department)
President's Reorganization Project
White House Office

Titled *A Guide to Publications of the Executive Office of the President*, copies are available from: EOP Publica-

tions Unit, New Executive Office Building, Room G-236, Washington, DC 20500; tel. (202) 395-4660.

For a sample of what's contained, following is the list of publications for the Office of Science and Technology Policy. (As indicated in the last line of each publication listed, copies may be ordered at the following addresses.):

NTIS (National Technical Information Service)
Attn. Document Sales
5285 Port Royal Road
Springfield, Va. 22161
Tel. (703) 557-4600

GPO (Government Printing Office)
Attn. Order Desk
Washington, DC 20401
Tel. (202) 783-3238

OSTP (Office of Science and Technology Policy)
New Executive Office Building
Washington, DC 20500
Tel. (202) 456-7116

ALTERNATIVES FOR THE ANNUAL REPORT. THE FIVE-YEAR OUTLOOK.

Robert D. Crangle
June 1977 170 pp. OSTP
Avail: NTIS A/N PB-273-390

AN ANALYSIS OF THE BACK END OF THE NUCLEAR FUEL CYCLE WITH EMPHASIS ON HIGH-LEVEL WASTE MANAGEMENT

Vol. I
Aug. 1977 55 pp. OSTP
Jet Propulsion Laboratory
Avail: NTIS A/N N78-12823
Vol. II
Aug. 1977 195 pp. OSTP
Avail: NTIS A/N N78-12824

CARBON/GRAPHITE COMPOSITE MATERIAL STUDY — FIRST

ANNUAL REPORT 1978

Mar. 1979 107 pp. OSTP
Avail: NTIS A/N N78-25136

CHANNELING HEALTH: A REVIEW OF THE EVALUATION OF TELEVISED HEALTH CAMPAIGNS

Richard Law et al.
1979 66 pp. OSTP
Rand Corporation
Avail: NTIS A/N PB-292 050

DIRECTORY OF FEDERAL TECHNOLOGY TRANSFER

June 1977 223 pp. OSTP
Avail: GPO S/N 052-003-00376-7

EARTH INFORMATION FROM SPACE BY REMOTE SENSING

June 1978 42 pp. OSTP
Avail: NTIS A/N PB-292 736

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have been satisfied."

Another way to simplify the system for the universities if not for the government is the "master grant" approach. Under that system, universities would no longer be required to break down salaries, supplies, equipment, and travel in each grant. Instead, researchers could interchange funds "as necessary and appropriate" to carry out the work of related projects.

In defending the master grant proposal, AAU President Bartlett argued that the approach would neither hurt individual researchers nor violate the intentions of the government. It is easy, he said, to "underestimate the

ability of a principal investigator to protect his own grant." If researchers could control their own money, "you wouldn't have one Professor Phin Cohen here, you'd have a whole room full."

The final word on all of these complex accounting matters is expected to be delivered sometime this fall when the National Commission on Research begins publishing its recommendations. The Commission, which is independent of both the government and the universities but working closely with them, is being looked to by both parties for remedies that have so far proven to be extremely difficult to devise. — Anne Roark

(The author is an assistant editor of *The Chronicle of Higher Education*.)

... Science Office List Spans Numerous Topics

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EARTHQUAKE HAZARD REDUCTION: ISSUES FOR AN IMPLEMENTATION PLAN

Dec. 1978 248 pp. OSTP

Avail: NTIS A/N PB-290 467

FEDERAL DAM SAFETY: REPORT OF THE OSTP INDEPENDENT REVIEW PANEL

Dec. 1978 57 pp. OSTP

Avail: NTIS A/N PB-290 565

IDENTIFICATION, CHARACTERIZATION, AND CONTROL OF POTENTIAL HUMAN CARCINOGENS: A FRAMEWORK FOR FEDERAL DECISION-MAKING

Feb. 1979 40 pp. OSTP

Avail: NTIS A/N PB-290 975

IMPROVING FEDERAL DAM SAFETY

July 1978 201 pp. OSTP

Avail: NTIS A/N PB-290 466

INFORMATION SYSTEMS NEEDS IN THE EXECUTIVE OFFICE OF THE PRESIDENT

Dec. 1977 22 pp. OSTP

Avail: OSTP

INSTITUTE OF MEDICINE REPORT OF A STUDY: HEALTH SERVICES RESEARCH

1979 102 pp. OSTP

Avail: NTIS A/N PB-294 584

LANDSAT'S ROLE IN AN EARTH RESOURCES INFORMATION SYSTEM

June 1977 47 pp. OSTP

Avail: NTIS A/N PB-269 456

NAS REPORT: CLIMBING THE ACADEMIC LADDER: DOCTORAL WOMEN SCIENTISTS IN ACADEME

Mar. 1979 155 pp. OSTP

Avail: NTIS A/N PB-294 667

THE NATIONAL EARTHQUAKE HAZARDS REDUCTION PROGRAM

1978 32 pp. OSTP

Avail: NTIS A/N PB-293 311

NEW DIRECTIONS IN FEDERALLY-SUPPORTED HUMAN NUTRITION RESEARCH

Dec. 1977 35 pp. OSTP

Avail: NTIS A/N PB-295 942

PRINCIPAL CONCLUSIONS OF THE AMERICAN PHYSICAL SOCIETY STUDY GROUP ON SOLAR PHOTOVOLTAIC ENERGY CONVERSION

1979 196 pp. OSTP

American Physical Society

Avail: NTIS A/N PB-292 164

RADICALLY INNOVATIVE STEEL MAKING TECHNOLOGIES: REPORT OF THE COMMITTEE ON THE STEEL INDUSTRY STUDY FOR THE OFFICE OF SCIENCE AND TECHNOLOGY POLICY

1978 53 pp. OSTP

Avail: NTIS A/N PB-290 721

REPORT OF THE WORKING GROUP ON BASIC RESEARCH IN THE DEPARTMENT OF DEFENSE

June 1978 23 pp. OSTP

Avail: NTIS A/N PB-290 758

REPORT OF THE OFFICE OF SCIENCE AND TECHNOLOGY

POLICY WORKING GROUP ON BASIC RESEARCH IN THE DEPARTMENT OF ENERGY

June 1978 39 pp. OSTP

Avail: OSTP

REPORT TO FEDERAL COORDINATING COUNCIL FOR SCIENCE, ENGINEERING AND TECHNOLOGY, AD HOC COMMITTEE ON EARTH RESOURCES SATELLITES, FROM AD HOC GROUP ON GROUND DATA PROCESSING SYSTEMS

Oct. 1977 68 pp. OSTP

Avail: NTIS A/N PB-295 947

REPORT TO THE PRESIDENT BY THE INTERAGENCY REVIEW GROUP ON NUCLEAR WASTE MANAGEMENT

Mar. 1979 146 pp. OSTP

Avail: NTIS A/N TID-29442

RESOURCES FOR THE FUTURE, A DESIGN FOR THE PRESIDENTS ANNUAL SCIENCE AND TECHNOLOGY REPORT AND FIVE-YEAR OUTLOOK

Theodore J. Gordon

Vol. 1. Handbook of Operations

Apr. 1977 38 pp. OSTP

Avail: NTIS A/N PB-273 432

Vol. 2 Legislative Intent and Audience Expectations for the Science and Technology Report and Outlook

Apr. 1977 134 pp. OSTP

Avail: NTIS A/N PB-273 433

Vol. 3. Design and Production of President's Report

Apr. 1977 85 pp. OSTP

Avail: NTIS A/N PB-273 434

REVIEW OF THE US/USSR AGREEMENT ON COOPERATION IN THE FIELDS OF SCIENCE AND TECHNOLOGY

May 1977 120 pp. OSTP

Avail: NTIS A/N PB-287 487

SCIENTIFIC AND TECHNOLOGICAL ASPECTS OF WATER RESOURCES POLICY

Jan. 1978 48 pp. OSTP

Avail: NTIS A/N PB-295 945

STATE AND LOCAL GOVERNMENT PERSPECTIVES ON A LANDSAT INFORMATION SYSTEM

June 1978 267 pp. OSTP

Avail: NTIS A/N PB-284 194

SUBGROUP REPORT ON ALTERNATIVE TECHNOLOGY STRATEGIES FOR THE ISOLATION OF NUCLEAR WASTE (DRAFT)

Oct. 1978 237 pp. OSTP

Avail: NTIS A/N TID-28818

SUMMARY OF SURVEY ON THE FEDERAL ROLE IN SATELLITE COMMUNICATIONS RESEARCH AND DEVELOPMENT

July 1978 32 pp. OSTP

Avail: NTIS A/N PB-295 949

A TECHNICAL REVIEW OF THE BIOLOGICAL EFFECTS OF NON-IONIZING RADIATION

May 1978 108 pp. OSTP

Avail: NTIS A/N PB-290 166

THREE CASE STUDIES IN ENVIRONMENTAL REGULATION

1979 192 pp. OSTP

Environmental Law Institute

Avail: NTIS Pending

A UNITED STATES CLIMATE PROGRAM PLAN

July 1977 94 pp. OSTP

Avail: NTIS A/N PB-295 946

UN Science Conference: What Agenda Says, What it Means

The formal agenda of the United Nations Conference on Science and Technology for Development (UNCSTD), August 20-31 in Vienna, Austria, is bureaucratically dry and looks ideologically uninteresting. But the four main topics that have been certified for the conference are enormously controversial in the context of the rich versus the poor nations.

Following are these topics, as stated in a UN press release, illuminated by SGR's own commentary as to what's really involved:

1. "The role of science and technology in development, including the removal of obstacles to their better utilization, especially in the developing countries." Key words here are "obstacles" and "especially." The former refers to what the developing countries — allied for the conference in the so-called Group of 77 — regard as the rich nations' exploitative use of R&D. While products and even manufacturing facilities are shipped to the less-developed countries, they feel they're being denied the R&D skills and technological know-how that separate the backward from the forward in the modern world. Thus, they're determined to catch up by prodding or embarrassing the richer nations to be more forthcoming with assistance for developing R&D skills and resources. And, the poorer nations don't want this

assistance to be concentrated in the research centers of the rich — which accounts for the reference to "utilization, especially in developing countries."

2. "Suitable institutional arrangements and possible new forms of international cooperation in the application of science and technology." Among other things, this refers to the rich nations' preference for doling out R&D assistance in ways that will not come home to haunt them in the form of manufactured goods from cheap-labor nations; they feel it's okay if they own and manage manufacturing plants in the less-developed countries, but they don't care one bit for the poor to get up to world-standard speed in R&D and then turn this new capability into serious marketplace competition. What's "suitable" for the rich is not at all suitable for the poor.

3. "Ways and means of making better use of the UN system." What's meant here is that the UN's existing R&D-related agencies are in, one way or another, dominated by the industrialized nations; what the poor want is a new agency, with money, that can look after their needs.

4. "Science and technology and the future." This is the catchall agenda item that can accommodate just about anything.

US Delegates Say Preparation Insufficient

Two Congressional committees took a look last month at US preparations for the August 20-31 United Nations Conference on Science and Technology for Development (UNCSTD) and heard a slew of witnesses tell them that though the conference has been in the works for three years, the US has done little to prepare for it.

"I must say that we will be traveling light so far as US initiatives go," said William D. Carey, Executive Officer of the American Association for the Advancement of Science and one of the US delegates to the conference:

"Unless we're just going to Vienna as tourists," he remarked, "we're going to need some fairly specific counseling on just what the US positions are . . . I just hope we don't get our instructions at the airport."

The criticism of the State Department's preparatory efforts came at an unusual joint session of the Senate Subcommittee on Science, Technology, and Space and the House Subcommittee on Science, Research, and Technology. The purpose of the session was to brief Congress on US preparation for the Conference. "I'm not sure any of us understands why it's taken so long," said Lucy Wilson Benson, Under Secretary for Security Assistance, Science, and Technology at the State Department.

"Some student may do a study some day of why it takes us so long to get our act together. We've been deeply

frustrated."

"But I must admit," she added, "that I count myself among those people — perhaps crazy people — who hope we'll get there before it's too late."

The problem, according to Rep. George E. Brown Jr. (D-Calif), Chairman of the House Subcommittee on Science, Research, and Technology, is that the US has spent too much time "reacting" to what some consider the unreasonable demands of the less-developed countries and too little time coming up with its own concrete objectives.

So far the only firm US offering for the meeting has been the proposed Institute for Scientific and Technological Cooperation, a long-gestating federal agency designed to focus R&D efforts on the needs of the developing world. Until last week, however, even that plan was in danger. Following approval in the House, conservative senators knocked the proposed Institute out of a foreign-aid reorganization bill. But a conference of House-Senate negotiators finally restored the Institute.

In the meantime, another battle is under way about funds for the Institute, the annual budget of which would amount to less than \$100 million, with over three-quarters of the funds to be transferred from existing budgets in the Agency for International Development.

Science Policy Who's Who: DoD's Top Advisers

Little is heard publicly of the Defense Science Board (DSB), the topmost science advisory body in the Pentagon. But since physicist Harold Brown became Defense Secretary and installed Eugene G. Fubini—a veteran mandarin of military R&D—as chairman of the DSB, the board has broadened its membership and is said to have risen in influence. Following, as part of SGR's occasional listings of who's who in Washington science-policy affairs, is the current membership of the DSB:

Eugene Fubini, Washington consultant, chairman
James P. Wade, assistant to the Secretary of Defense for atomic energy, vice chairman
John D. Baldeschwieler, professor, Division of Chemistry and Chemical Engineering, Caltech
Ivan L. Bennet Jr., dean, NYU School of Medicine
Davis B. Bobrow, professor, Department of Government and Politics, University of Maryland
Solomon J. Buchsbaum, vice president, Bell Labs
Richard D. DeLauer, executive vice president, TRW, Inc.
John M. Deutch, director of energy research, Department of Energy
Russell E. Dougherty, general, USAF (ret.)
Charles A. Fowler, vice president, Bedford Division, the MITRE Corp.

Noel Gayler, admiral, USN (ret.)
Norman Hackerman, president, Rice University
Harold W. Lewis, professor, Department of Physics, UC Santa Barbara
Vincent V. McRae, director of strategic planning, IBM
Robert N. Noyce, chairman of the board, Intel Corp.
Thomas C. Reed, president, Quaker Hill Development Corp.
Donald B. Rice, president, RAND Corp.
John H. Richardson, president, Hughes Aircraft
Henry S. Rowen, professor, School of Business, Stanford University
George S. Sebestyen, Defense Systems, Inc.
Fred N. Spiess, director, Marine Physical Laboratory, Scripps Institution of Oceanography
Sayre Stevens, Northrop Corporation Analysis Center
Ivan E. Sutherland, head, computer science, Caltech
Richard L. Wagner Jr., executive associate director, Lawrence Livermore Laboratory
Roberta Wohlstetter, Pan Heuristics (Los Angeles)
Herbert F. York, professor, department of physics, UC San Diego

The DSB also includes about 20 ex officio members and consultants at large, similar in station and status to those listed as members. The executive officer of the DSB is Paul J. Berenson. The address of the DSB Secretariat is: Room 3D1034, the Pentagon, Washington, DC 20301; tel. (202) 695-4157.

Science & Government Report International Almanac

Final pre-publication orders, at \$21 below list price, are now being accepted for the new edition of SGR International Almanac. Following upon the first edition, which was published last year, the forthcoming volume will consist of original review articles on science-policy developments in all the industrialized and major developing countries, plus the texts of major science-policy documents issued over the past year. Written by leading science-policy specialists from over 20 countries, SGR International Almanac has won wide acclaim as a standard text in its field.

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In Quotes: A Pioneering Tally of World R&D

The following excerpts are from "Knowledge and Power: The Global Research and Development Budget," by Colin Norman, of the Worldwatch Institute. Published as Worldwatch Paper 31, the article is to be included in Norman's forthcoming book, *The God that Limped: Technology for a Finite World* (W. W. Norton 1980). Copies of "Knowledge and Power," 56 pages, are available for \$2 each from: Worldwatch Institute, 1776 Massachusetts Ave. Nw., Washington, DC 20036; tel. (202) 452-1999.

Research and development is now a \$150 billion global enterprise employing some three million scientists and engineers... The largest single item by far is the advancement of military technology. More than \$35 billion a year, roughly one-fourth of the world's investment in research and development, is swallowed up by military programs, and over a half million scientists are believed to be working on the development of new weapons. The second largest area of expenditure is basic research... About 15 per cent of the world's R&D funds are spent on such attempts to push back the frontiers of knowledge. The next most important item is space R&D, which accounts for approximately 8 per cent of the total outlays. Although the proportion devoted to space research has declined... more than \$10 billion is spent worldwide on nonmilitary space activities each year...

A study by Jan Annerstedt of Roskilde University in Denmark indicates that in the early seventies, six countries — the United States, the Soviet Union, West Germany, Japan, France, and Britain — accounted for about 85 per cent of the world's R&D expenditures, and employed about 70 per cent of its scientists and engineers. The developing countries of Africa, Asia, and Latin America between them spent less than 3 per cent of the global R&D budget, and employed just 13 per

cent of the world's scientists and engineers... In 1979, the United States will spend [on R&D] about \$200 for every person in the country, and several European nations will spend close to that level. In contrast, most Latin American nations will spend less than \$5 per person, and the poorer countries of Africa and Asia will be able to afford less than \$1 per person...

In the United States and Britain, more tax revenues are spent on the development of military technology than on all other government-supported R&D programs combined. In France, about 30 per cent of the government's R&D budget goes to the military. In contrast, Germany devotes about 11 per cent of its public research funds to military science, and Japan spends only 2 per cent... While military R&D continues to dominate the science budgets of some countries, its share of total public research funds has declined in the Western world in the past two decades. Britain seems to be the only major country in which military R&D has claimed a growing share of the public science budget during the seventies...

In the United States, the Soviet Union, and Japan, between 12 and 15 per cent of the total R&D expenditure goes into basic research. In Britain, the share is about 16 per cent, in France it is about 20 per cent, and in Germany between 20 and 25 per cent...

Driven by the political and commercial motivations of governments and corporations in the industrial world, the global research and development system is poorly attuned to the needs of the developing countries in general and to the requirements of the poorest people in those countries in particular. Not only does that lack of R&D capacity in Third World countries perpetuate their dependence on imported technology, but it also means the technologies produced are overwhelmingly geared to the economic environment of the industrial countries — they are capital-intensive, labor-saving, and adapted to large-scale enterprises...

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